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nor in that of the British Association, nor is it drawn in the maps of Kirchhoff, Piazzi Smyth, or Fievez. It could not be seen on May 6, and was again carefully searched for with the same result on May 21, 1889. Yet it is marked as widened in the spot of May 27, 1884.

The Nebula G. C. 2091. By E. E. Barnard, M.A., Astronomer of the Lick Observatory.

In the *Observatory* for April 1885 Mr. Sadler called attention to this nebula, and brought forward seemingly strong proof of motion. This is the nebula in which the double star *h* 2529 was observed, according to Sir John Herschel, twice in 1830 and once in 1831.

The nebula has also been observed by D'Arrest, and at Parsonstown; but it is not clear from the records that any of the observers since Herschel saw the double star to recognise it as such, though it is mentioned by them.

Mr. Burnham observed this nebula in 1879 and 1882, and measured the position-angle and distance from the tenth-magnitude star south of it. His measures are:

1879·225	8°·3	18″·96
1882·195	7°·5	18″·96

He estimated the magnitude of the star as 10, and the nebula as 12.

On March 5 of this year I examined the nebula with the 12-inch, and measured the position-angle and distance from the tenth-magnitude star—

1889·178 7°·8 (5 Obs.) 18″·96 (6 Obs.),

the distance coming out singularly enough the same as Mr. Burnham's two measures.

The nebula was small, round, and brighter in the middle, and quite easy to measure. I estimated the equivalent light to be of the twelfth magnitude.

On March 21, 23, and 24 Mr. Burnham and I examined this nebula with the 36-inch refractor. It was found to have an extension preceding and slightly north. This resembled a faint tail and was about 25″ long. In this extension was a faint condensation, which at first gave the appearance of a distinct nebula separated from the principal one. There was also a very faint extension for 10″ following and slightly south. Several times an excessively faint and difficult nucleus was seen, which did not appear to be stellar. A very faint star was thought to be involved in the preceding end of the tail, but it could not be seen steadily enough to make its existence certain. On each night the tenth-

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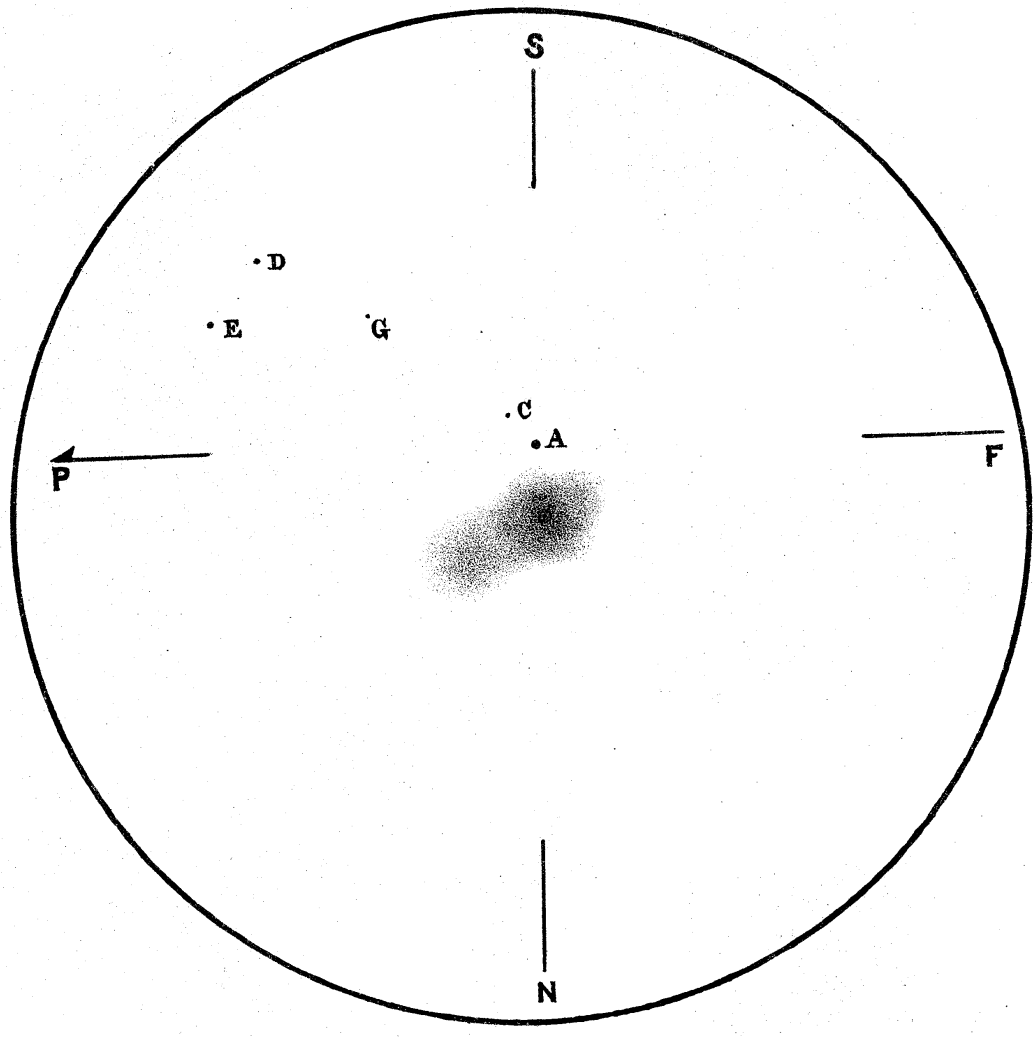

The Nebula G.C. 2091, 1889 March 23.
36 inch Refractor. E.E. Barnard.

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magnitude star was carefully examined by Mr. Burnham and myself; and Mr. Burnham is certain it is not now double, and that there is no double star about the nebula.

On March 23 I made a careful sketch of the nebula and of all the stars that could be seen in the field, which I here submit. The magnifying power used was 390. Some estimates were also made of the brightness of the objects shown in the sketch.

Mr. Burnham estimated A as 10th magnitude and C as 13th magnitude, which were about the magnitudes I should have assigned them. From my estimations the centre of the nebula was less bright than A, and was just perceptibly brighter than C.

The southern limit of the nebula, as near as I could estimate, was exactly one-half the distance from the nucleus to the star A. The star D is brighter than C, but less than E. The small star G is of the 14th magnitude, or fainter. No other stars besides those drawn were visible near the nebula or the star A.

In examining the region near the nebula on March 23 Mr. Burnham found a small double star $1^m\ 38^s$ *p.* and $2' \pm$ south of the nebula, which he estimates: Distance $1\frac{1}{2}''$; Pos. Ang. 160°; Mag. 8 — 11. This star is DM. + 13° 2244.

On June 7 I referred the tenth-magnitude star to the star Schj. 3813–14 with the filar micrometer of the 12-inch equatorial.

10^m ✱ — Schj. 3813–14; $\Delta\alpha = -1^m\ 15^s{\cdot}13$ (6 Obs.); $\Delta\delta - 10'\ 7''{\cdot}5$ (3 Obs.).

This gives the place of the small star

α 1889·0 $= 10^h\ 17^m\ 48^s{\cdot}58$ δ 1889·0 $= +13°\ 7'\ 25''{\cdot}7$.

From my position-angle and distance I get

neb. — 10^m ✱ $\Delta\alpha = +0^m\ 0^s{\cdot}18$ $\Delta\delta = +0'\ 18''{\cdot}8$,

and the resulting place of the nebula G. C. 2091

α 1889·0 $= 10^h\ 17^m\ 48^s{\cdot}76$ δ 1889·0 $= +13°\ 7'\ 44''{\cdot}5$.

On this occasion with a bright Moon the nebula was easily seen, but the star C with great difficulty. This star under favourable circumstances is easy in the 12-inch.

Whether the proper interpretation has been given to the earlier descriptions it is perhaps impossible to say, but the more recent observations do not indicate any change, and seem to justify the inference that there may be some question of the identification of the nebula, since it is wholly impossible that the double star should have disappeared absolutely, or that the nebula and star should have changed and subsequently remained fixed.

The present drawing shows faithfully all that can now be seen with the 36-inch, and will aid hereafter in deciding whether any change has really taken place.

Mount Hamilton: 1889, *June* 8.

K K

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